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Targeting Efficiency in the Conservation Security Program

Resource and Environmental Policy Division, Center for Agricultural and Rural Development

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Resource and Environmental Policy Division
card-rep@iastate.edu
515-294-5767

The much anticipated implementation rules for the Conservation Security Program (CSP), authorized in the 2002 Farm Security and Rural Investment Act, were unveiled January 2, in the *Federal Register*. In addition to describing the proposed rules, the Natural Resources Conservation Service outlines the challenge they faced in constructing a coherent implementation plan for a program that was initially developed as an entitlement program but later faced funding caps. The magnitude of this challenge is aptly summarized by the USDA's Economic Research Service, which finds that if all of the 1.8 million farms and ranches likely to be eligible for the program were to enroll, the total budgetary cap of $3.77 billion would be completely exhausted in the first sign up.

One of the approaches proposed by USDA to limit the expenditures associated with the program is to "target" conservation funds to watersheds identified as high priority. This is controversial to some because it means that some locations will receive conservation dollars to the exclusion of others. There are other ways in which the proposed rules are targeted: payments will differ in different parts of the country to reflect differences in land rental rates, and farmers with track records in conservation practices will receive higher priority.

We briefly describe here the different ways in which conservation funds can potentially be targeted, the history of targeting in conservation programs, some evidence on the degree to which targeting of environmental funds is efficient, and a few insights on the possible consequences of targeting CSP funds to alternative watersheds in Iowa.

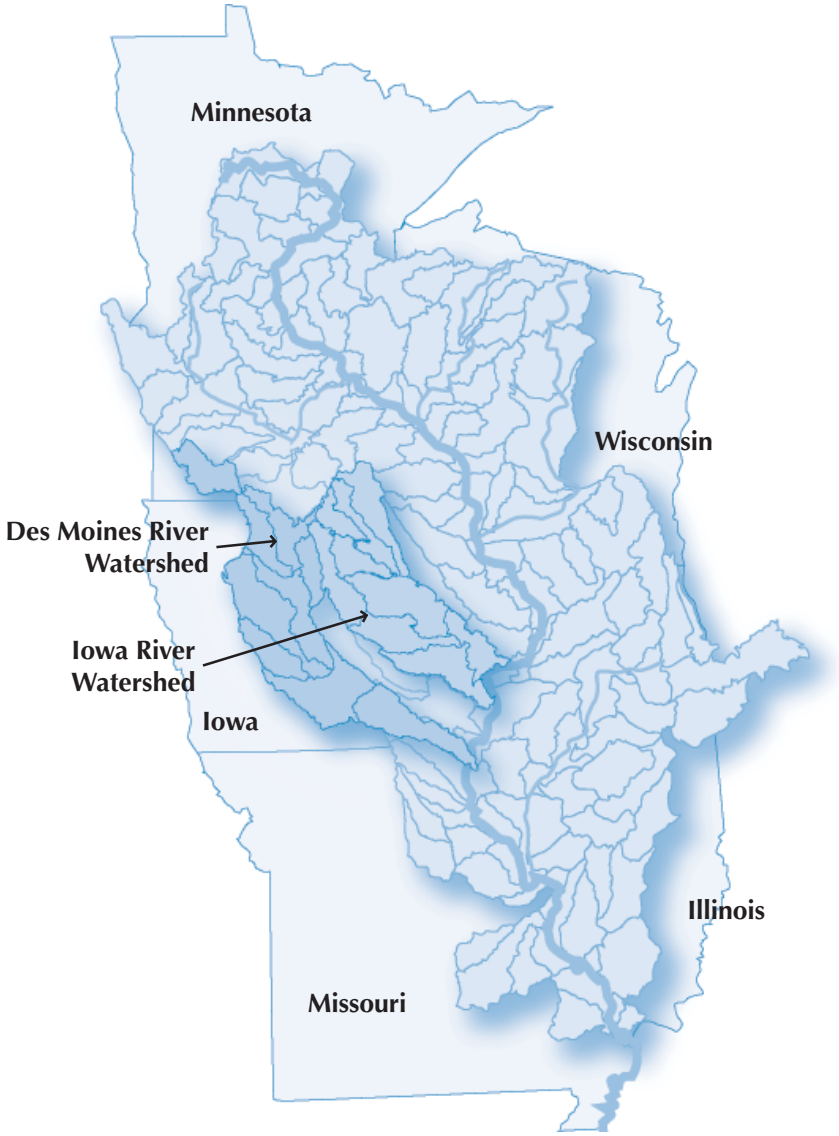

FIGURE 1. DES MOINES RIVER AND IOWA RIVER WATERSHEDS

WHAT IS TARGETING?

The term "targeting" can apply to a variety of payment practices. The common element among these schemes is that not all farmers or ranchers necessarily receive the same payment for a given practice or action. Instead, some criteria are used to differentiate among the sources. Historically, conservation programs in the United States have employed a variety of targeting approaches over the years.

Conservation Reserve Program (CRP) payments initially enrolled land designated as highly erodible. This effectively targets payments geographically based on soil and topographical characteristics. A second way in which CRP has targeted payments is by using a bidding system to enroll farmers into the program who are willing to participate at the lowest cost. This is a form of

cost targeting. The most complete form of targeting used in the CRP has been the use of the Environmental Benefits Index, which considers both the environmental benefits associated with enrolling a parcel of land in the program (items such as water and air quality, wildlife habitat, and soil quality among others) and the costs.

Another significant conservation program that has employed various targeting tools is the Environmental Quality Incentives Program (EQIP). Notably, EQIP has targeted those practices and geographic locations that contribute to environmental benefits that are specific national priorities, defined by the Natural Resources Conservation Service. Interestingly, while this program has historically targeted both cost and geographic priority areas, the 2002 legislation specifically prohibits such targeting.

One relatively new target that the CSP program identifies is producers who have already demonstrated that they are "good stewards." In particular, in the proposed rules, conservation producers will be categorized based on their previous environmental stewardship, and those in the highest categories will receive first priority for funding. This policy has the interesting consequence of targeting funds for environmental improvement to locations where some improvements have already occurred.

The Benefits of Targeting

While the motivation for targeting in the CSP appears largely to be based on the high cost of a nontargeted approach, there is a strong case to be made for the targeting of conservation funds even when conservation budgets are not as strained. The conservation benefits from enrolling a parcel of land in the CRP, EQIP, or the new CSP will differ, often substantially, depending upon the soil characteristics, slope, previous cropping practices, or location of that parcel. For example, creating a small wetland in an area that drains highly nutrient-rich farmland will likely yield substantially greater water quality benefits than placing that wetland where nutrient cleaning benefits will not occur. Likewise, installing a stream buffer on a parcel with highly erosive soils will yield greater erosion benefits than installing such a buffer on flat, low-eroding soils.

In fact, the research to date on the cost effectiveness of targeting conservation funds provides strong support for the benefits of such a strategy. In a 1996 study, Babcock et al. demonstrated that 90 percent of the water erosion benefits from enrolling land in CRP could have been achieved with only half the total CRP budget if the land chosen for enrollment had been targeted specifically for water erosion benefits. Similarly, Feng et al. (2003) demonstrated that at the beginning of CRP, when erosion reduction was a major goal of the program, if payments were targeted at land with the highest erodibility indices, the average erodibility index of enrolled land in Iowa would be more than twice as high as that of the actually enrolled land.

It should be noted that not all forms of targeting will necessarily result in more cost-effective conservation. In fact, as previously noted, the CSP proposal to focus additional environmental improvements on land that is already under some conservation practices may mean that land that would most yield environmental benefits might be passed over in favor of land that is managed by good stewards.

Watershed Targeting in the Conservation Security Program

While previous research indicates that targeting is often very cost effective, generating significantly more environmental benefits with a fixed budget than would occur if funds were disbursed indiscriminately, this does not necessarily mean that the

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Table 1. Scenario results for the Iowa and Des Moines River Watersheds

(1) Scenario	(2) Annual Average Baseline Sediment (10^6 mt*)	(3) Percentage Sediment Reduction	(4) Sediment Reduction per Acre Converted to Conservation Tillage (mt/acre)	(5) Total Cost of Sediment Reduction (10^6 dollars)	(6) Average Cost of Sediment Reduction (dollars/mt)
Iowa River in Conservation Tillage	5.00	5.8	0.108	33.4	115.2
Des Moines River in Conservation Tillage	2.85	5.7	0.067	26.3	161.9

*mt = metric tons

Risk Free Farming?
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market returns will be greater than variable costs is only 54 percent. Government programs increase expected returns by 516 percent to $200/ac. And the probability that returns over variable costs fall below expected revenue with no government programs is zero. Thus, government has taken the risk out of cotton farming.

U.S. crop producers largely have obtained what they sought: risk-free farming courtesy of government programs. This conclusion implies nothing about the relative merits of the various programs or whether the programs should be modified. But the programs do create the incentive for farmers and landlords to focus on growing the commodities that are supported by farm programs. Furthermore, an increased incentive to plant those hybrids and varieties that have the highest yields and lowest costs is what we would expect from a program designed to meet the interests of the most efficient producers of commodities. The programs would look quite different had the durum wheat and white corn producers been instrumental in their design. ◆

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targeting of watersheds will be equally beneficial.

In an attempt to provide some insight into the potential importance of targeting funds to various watersheds, we employed a water quality model, the Soil and Water Assessment Tool, to simulate adoption of conservation tillage (one of the practices included in the CSP) in the Des Moines River Watershed and the Iowa River Watershed. We combined this model with an economic model predicting the costs of obtaining adoption of conservation tillage in these watersheds based on a payment program like the CSP. To highlight the potential consequences of targeting, we consider two scenarios: full adoption of conservation tillage in the Des Moines River Watershed with no additional adoption in the Iowa River Watershed and the opposite adoption pattern (no new adoption in the Des Moines River and full adoption in the Iowa River Watershed).

Table 1 shows the levels of sediment (based on a 20-year projected average) and the estimated costs at the watershed outlets. As columns 1-3 indicate, the estimated percentage reduction in sediment erosion between the two scenarios is about the same (about 6 percent), but the original level of sediment load is much higher in the Iowa River Watershed than in the Des Moines River Watershed. Thus, the total sediment load reduction is about twice as high by targeting the Iowa River Watershed. This is consistent with column 4, which reports the average sediment load reduction per acre of land converted to conservation tillage.

However, the costs of adoption can vary significantly with targeting and need to be considered in assessing the consequences of targeting. The median cost of adopting conservation tillage in the two watersheds is about 20 percent higher in the Iowa River Watershed (we estimate the median costs of adoption to be $11/acre in the Des Moines River Watershed). While the total cost of sediment reduction is higher in the Iowa River Watershed, the per ton cost of sediment reduction is significantly lower (see columns 5 and 6). Targeting the Iowa River Watershed results in a higher overall reduction in sediment at a lower average cost per ton than does targeting the Des Moines River Watershed.

This particular example is only indicative of the different outcomes that could occur under various targeting mechanisms. However, the results of this simple simulation suggest that by targeting different watersheds, as proposed in the CSP, the Natural Resources Conservation Service will significantly affect the location, degree, and cost effectiveness of water quality improvements. Details of this research and other studies focusing on the consequences of targeting and conservation programs can be found at www.card.iastate.edu/environment/.◆

Resource and Environmental Policy staff who contributed to this article are Hongli Feng, Philip Gassman, Luba Kurkalova, Silvia Secchi, and Catherine Kling.